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AGENCY OF ENVIRONMENTAL CONSERVATION

DEPARTMENT OF FORESTS, PARKS AND RECREATION

STATE OF VERMONT

FOREST INSECT AND DISEASE CONDITIONS

SOUTHERN REGION

CALENDAR YEAR 1986

PREPARED BY: Barbara S. Burns,
Specialist, Forest Resource Protection

John P. Barrows
Peter J. Norkeveck
Allan D. Sands
Forest Resource Protection Technicians

INTRODUCTION

The information in this report is based on aerial surveys to detect defoliation, as well as ground surveys and observations of Forest Resource Protection personnel and other forestry staff, District-wide aerial surveys were flown late in the season (District I: 9/9), District II: 8/20). Additional surveys were a flight over southern Windsor County to assess ice damage (4/26) and a flight over the Green Mountain National Forest with U. S. Forest Service personnel (7/1). Diagnostic assistance was provided by the University of Vermont and the U. S. Forest Service.

The growing season began early, with warm weather in late March. Phenology remained one to two weeks ahead of schedule into June. Although April was dry, precipitation through the rest of the growing season was above average. Frosts in early May and on June 3, and several severe weather events resulted in scattered damage. The season ended early, with some frost in late August, and peak foliage by the end of September.

The wet weather allowed a variety of fungus diseases to develop, but may have helped keep insect populations in check.

FOREST INSECTS

HARDWOOD DEFOLIATORS

PEAR THRIPS, Taeniothrips inconsequens, damaged sugar maple foliage again this year. A sugarbush in Woodstock sustained enough damage to cause refoliation. Elsewhere, damage from thrips was less than in 1985. Early shoot development this year may have given the leaves more time to develop before thrips emergence was complete.

The first thrips adults observed in 1986 were on April 12 in Dummerston. By April 24, buds in that area were 1/2" to 1-1/2" long. (In general, phenology in 1986 was one or two weeks ahead of normal). The first immatures were seen on May 12 in Danby. At that time, leaves were 3/4 to fully expanded.

Thrips monitoring plots were established in two sugarbushes in Danby, and one each in Sunderland, Dummerston, and Landgrove. Tanglefoot-coated cups were three feet off the ground near co-dominant maples. Although thrips were caught, counts were difficult because many other insects were caught as well. Bud counts or emergence traps will be tried in 1987.

Bud counts in late April (4/28), and defoliation ratings in late August (8/29) correlated well for the Landgrove sugarbush. The results appear in the table, below. Twenty buds were collected from regeneration near each sample trees when leaves were 1/4 expanded. Sample trees were at least two chains apart, running downhill.

Relationship between early Thrips numbers and sugar maple defoliation in a Landgrove Sugarbush

Sample Tree % Defoliation 8/29	Average # Thrips/Bud* on Regeneration (4/28)
0	0.3
20	0.9
10	0.35
30	0.75
50	1.45

*Average from 20 buds

The results from the Danby sugarbushes were comparable. In one, thrips/bud averaged 1.3 for the sugarbush and defoliation was in the 20-35% range. In the other, thrips/bud averaged 1.0 and defoliation was 10-20%.

MAPLE LEAF CUTTER, Paraclemensia acerifoliella, caused light defoliation, visible from the air, of 270 acres in Rutland and Windsor County, including 15 acres of sugarbush. Towns affected were Rochester (110 acres), Stockbridge (52 acres), Bethel (48 acres), and Sherburne (60 acres). Elsewhere in the region, populations were light, with scattered damage to lower crowns only.

GYPSY MOTH, Lymantria dispar, populations remain low, with no noticeable defoliation. Seven focal point monitoring plots have been established in the region in the towns of Sandgate, Benson, Rutland, Mendon, West Rutland, Rockingham, Brattleboro and near Pownal. Larval counts are similar to 1985. This work, in cooperation with the University of Vermont, is designed to concentrate monitoring in areas where gypsy moth outbreaks are historically detected first. The only parasitism observed was of a third-instar larva on Hanley Mountain.

FOREST TENT CATERPILLAR, Malacosoma disstria, populations remain low, with no noticeable defoliation. Individual caterpillars were observed in Brattleboro, Rutland and Mendon. A cluster of pheromone traps in the Rochester Mountain area caught the same number of moths as in 1985, indicating that populations are static at low levels. Traps were put in at seven locations in the region by the U. S. Forest Service on the Green Mountain National Forest. The most moths were caught near Manchester, with trap catches decreasing in the more northern sites. Dieback from previous defoliations is still visible from the air in previously mapped locations. Total acres defoliated by forest tent caterpillar between 1976 and 1982 were determined by overlaying annual defoliation maps. This showed that 133,140 acres in the region were defoliated in the region at least once during that outbreak. A breakdown by number of defoliations is in Table 1.

Table 1. Acres defoliated by Forest Tent Caterpillar from 1976-1982 by number of years defoliated.

	Number of Years Defoliated				
	1	2	3	4	Total
Acres	102,150	26,840	3,560	590	133,140

HARDWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Birch Leaf Miner *Fenusa pusilla*	White Birch Yellow Birch	Throughout	With Birch Skeletonizer, causing heavy birch defoliation throughout. Heaviest areas in Rupert, Pawlet and Poultney.
Birch Leaf Folder *Ancylis discigerana*			Not observed.
Birch Skeletonizer *Bucculatrix canadensisella*	White Birch Yellow Birch		With Birchleaf Miner, causing heavy birch defoliation throughout.
Bruce Spanworm *Operophtera bruceata*			Not observed.
Eastern Tent Caterpillar *Malacosoma americanum*	Cherry Apple	Windham & Windsor Counties	Occasional nests and caterpillars observed.
Elm Leaf Beatle *Pyrrhalta luteola*			Not observed.
Elm Sawfly *Cimbex americana*	Hardwoods	Woodford	
Fall Cankerworm *Alsophila pometaria*			Not observed.

HARDWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Fall Webworm *Hyphantrea cunea*	Roadside Cherry and other Hardwoods	Windham & Windsor Counties	Some trees completely defoliated.
Forest Tent Caterpillar *Malacosoma disstria*			See text.
Green Striped Mapleworm *Anisota rubicunda*			Not observed.
Gypsy Moth *Lymantria dispar*			See text.
Half Winged Geometer *Phigalia titea*			Not observed.
Large Aspen Tortrix *Choristoneura conflictana*			Not observed.

HARDWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Linden Looper *Erranis tiliaria*			Not observed.
Locust Leaf Miner *Odontata dorsalis*	Black Locust	Putney Hartford	Heavy defoliation.
Maple Leaf Cutter *Paraclemensia acerifoliella*			See text.
Maple Trumpet Skeletonizer *Epinotia aceriella*	Sugar Maple	Danby	Causing light defoliation.
Maple Webworm *Tetralopha asperatella*			Not observed.
Mountain Ash Sawfly *Pristophora genicultata*			Not observed.

HARDWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Pin Oak Sawfly *Caliroa sp.*			Not observed.
Red-Humped Oakworm *Symmerista canicosta*	Oaks	Woodford	
Saddled Prominent *Heterocampa guttivata*	Hardwoods	Shrewsbury Sherburne Sandgate	Individual caterpillars observed. Five years after the last defoliation, some sugar maples being monitored at Downer State Forest continue to decline while others have recovered.
Satin Moth *Leucoma salicis*			Not observed.
Solitary Leaf Roller *Sparganothis pettitana*			Not observed.
Spring Cankerworm *Paleacrita vernata*			Not observed.
Uglynest Caterpillar *Archips cerasivoranus*	Cherry spp.	Readsboro	On regeneration.

HARDWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Oak Skeletonizer *Bucculatrix ainsliella*	Oak spp.	Throughout, Heavier in Bennington and Windham Counties	Early-June populations were light, with no significant defoliation. Second generation resulted in light defoliation throughout oak areas by early September.
Rusty Tussock Moth *Orgyia antiqua*		Springfield	Found on spruce under popple.
Hickory Tussock Moth *Halisidota caryae*	Hickories	Danby Weathersfield Springfield	Individual caterpillars observed.
American Dagger Moth *Acronicta americana*	Hardwoods	Weathersfield	Individual caterpillars.
Orangehumped Mapleworm *Symmerista leucitys*	Sugar Maple	Shrewsbury Weathersfield Rockingham Rutland Mt. Holly	Individual caterpillars common.
Oak Sawflies *Periclista* sp.	Oak spp.	Benson Vernon	Common in late May and early June.
Cherry Scallop Shell Moth *Hydria prunivorata*	Black Cherry	Throughout	Light damage in scattered locations.

SOFTWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Arborvitae Leaf Miner *Argyresthia thuiella*	Arborivitae	Chester	Moderate defoliation to hedge.
Introduced Pine Sawfly *Diprion similis*	White Pine	Pownal	Christmas trees.
Larch Casebearer *Coleophora laricella*			Not observed.
Larch Sawfly *Pristophora erichosonii*			Not observed.
Red Headed Pine Sawfly *Neodiprion lecontei*	Mugho Pine	Shaftsbury	
Spruce Budworm *Choristoneura fumiferana*			Not observed.

SOFTWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Spruce Bud Moth *Zeiraphera canadensis*			Not observed.
White Pine Sawfly *Neodiprion pinetum*			Not observed.
Yellow-headed Spruce Sawfly *Pikonema alaskensis*			Not observed.
Spruce Webspinning Sawfly *Cephalacia fascipennis*	White Spruce	Hartford	Ornamental.
European Pine Sawfly *Neodiprion sertifer*	Red Pine	Shaftsbury	

SAPSUCKING INSECTS, MIDGES & MITES

INSECT	HOST(S)	LOCALITY	REMARKS
Balsam Gall Midge *Paradiplosis tumifex*			Not observed.
Balsam Twig Aphid *Mindarus abietinus*	Balsam Fir	Windsor County	Moderate populations. Damage light.
Balsam Woolly Aphid *Adelges piceae*			Not observed.
Cooley Spruce Gall Aphid *Adelges cooleyi*	Douglas Fir White Spruce Blue Spruce	Springfield Pownal Bennington Mt. Holly and elsewhere	Damage heavy this year, particularly on Douglas Fir Christmas trees. Spring sprays have had mixed results. Several growers will try early fall sprays.
Eastern Spruce Gall Aphid *Adelges abietis*	Spruce spp.	Dorset Springfield Landgrove and elsewhere	Damage heavy this year. Ornamentals, Christmas trees and natural regeneration.
Oystershell Scale *Lepidosaphes ulmi*			Not observed.

SAPSUCKING INSECTS, MIDGES & MITES

INSECT	HOST(S)	LOCALITY	REMARKS
Pine Bark Aphid *Pineus strobi*	White Pine	Throughout	Not as evident as in previous years.
Pine Needle Midge *Contarinea baeri*			Not observed.
Pine Spittlebug *Aphrophora parallela*	Scots Pine Balsam Fir	Ludlow Springfield	Christmas trees.
Root Aphid *Prociphilus americanus*	Balsam Fir	Londonderry	On natural regeneration.
Spruce Spider Mite *Oligonychus ununguis*	Balsam Fir Fraser Fir Spruce spp.	Bennington Springfield	Heavy on individual Christmas trees and ornamentals.
Lecanium Scale *Lecanium* sp.	Sugar Maple Red Oak	Winhall Plymouth Bethel Wilmington	Causing dieback to ornamentals, sugarbush and forest trees. Occurs throughout crown and on regeneration. Dieback in stand in Plymouth visible from the valley.
Kermes Scale *Kermes* sp.	Red Oak	Bethel	Causing cankers and dieback.

SAPSUCKING INSECTS, MIDGES & MITES

INSECT	HOST(S)	LOCALITY	REMARKS
Pine Leaf Chermid *Pineus pinifoliae*	White Pine	Norwich	On regeneration.
Aphids *Cinara sp.*	Balsam Fir	Weston	Christmas trees.
Maple Bladder Gall Mites *Vasates quadripedes*	Silver Maple	Springfield	Ornamentals.
Treehoppers *Membracidae*	Red Oak Sugar Maple Chestnut and others	Pownal Sandgate Rockingham	Common on regeneration associated with distorted foliage.
Cottony Maple Scale *Pulvinaria innumerabilis*		Chester	Ornamental.
Maple Bark Scale *Cryptococcos williamsi*	Sugar Maple	Readsboro	Occasionally heavy in a recently thinned stand with some dying trees.

BUD, SHOOT & STEM INSECTS

INSECT	HOST(S)	LOCALITY	REMARKS
Balsam Shootboring Sawfly *Pleroneura bruneicornis*			Not observed.
Northern Pine Weevil *Pissodes approximatus*			Not observed.
Pales Weevil *Hylobius pales*			Not observed.
White Pine Weevil *Pissodes strobi*	White Pine Scots Pine Blue Spruce Douglas Fir	Throughout including Mt. Holly Westminster Springfield Rutland Shrewsbury Arlington	Unusually common problem on Christmas trees and ornamentals - Transplanted State Seal tree affected.
Spruce Coneworm *Dioryctria reniculella*	Fraser Fir Blue Spruce White Spruce	Springfield Shrewsbury	Christmas trees.
Red Maple Cambium Borer *Phytobia setosa*	Red Maple	Shaftsbury	On declining and nearby healthy trees.
White Grubs *Phyllophaga* sp.	Fraser Fir	Springfield	Causing mortality on converted agricultural land.
White Spotted Sawyer *Monochamus scutellatus*	White Pine	Springfield	On ornamentals planted too deep.

BARK BEETLES

INSECT	HOST(S)	LOCALITY	REMARKS
List any that were associated with or thought to be the cause of tree mortality			
Pine Engraver *Ips pini*	Red Pine Red Spruce	Bennington Weathersfield Plymouth Peru Hartford	Cause of mortality where populations have built up on trees stressed by root rot, poor drainage, or compaction.
Red Turpentine Beetle *Dendroctonus valens*	Red Pine	Weathersfield Chester	Occurring in stands affected by Annosus root rot.
Eastern Ash Bark Beetle *Hylesinus aculeatus*	White Ash	Springfield	Associated with dying trees.

STEM DISEASES

DISEASE	HOST(S)	LOCALITY	REMARKS
Beech Bark Disease *Cryptococcus fagisuga* and *Nectria coccinea* var. *faginata*	Beech	Throughout	Scale levels in monitoring plots increased in Ludlow and Sherburne, and decreased in Woodford. Chlorosis and dieback more visible from the air.
Cytospora Canker *Cytospora kunzei*	Blue Spruce	Occasional	
Dutch Elm Disease *Ceratocystis ulmi*	American Elm	Throughout	Tree in Springfield injected annually with fungicide since 1982 died from Dutch Elm Disease, confirmed by VT Dept. of Agriculture.
Fireblight *Erwinia amylovora*			Not observed.
Hypoxylon Canker *Hypoxylon pruinatum*		Widespread	
Scleroderris Canker *Gremmeniella abietina*			No symptoms resembling Scleroderris canker observed.

STEM DISEASES

DISEASE	HOST(S)	LOCALITY	REMARKS
Verticillium Wilt *Verticillium albo-atrum*			Not observed.
White Pine Blister Rust *Cronartium ribicola*	White Pine	Throughout	
Woodgate Gall Rust *Endocronartium harknessii*	Scots Pine	Rutland	Christmas trees.
Oak Wilt *Ceratocystis fagacearum*	Oak species		No suspects seen by trained observers during aerial flights.
Red Rot *Fomes pini*	White Pine	Throughout	Is increasing in importance as stands mature, even on vigorous trees. Price of affected, but merchantable logs drops $65/M.
Sapstreak *Ceratocystis coerulescens*	Sugar Maple	Reading	Dying trees with basal logging injury.
Eastern Dwarf Mistletoe *Arceuthobium pusillum*	Red Spruce	Hancock	Detected by Dr. Frank Hawksworth and Lew McCreery of the U. S. Forest Service.

FOLIAGE DISEASES

DISEASE	HOST(S)	LOCALITY	REMARKS
Anthracnose *Gloeosporium* spp.	Red Oak	Guilford Barnard	Apparent cause of twig dieback and defoliation in lower crown of large roadside and ornamental trees.
Lophodermium Needlecast *Lophodermium pinastri*	Scots Pine	Rutland Woodstock	Christmas trees and ornamentals.
Rhabdocline Needlecast *Rhabdocline pseudotsugae*			Not observed.
Rhizosphaera Needlecast *Rhizosphaera kalkhoffi*	White Spruce	Dorset	Diagnosis based on purple color of needles only. Christmas trees.
Swiss Needlecast *Phaeocryptopus gaumani*	Douglas Fir	Mt. Holly	Christmas trees.

FOLIAGE DISEASES

DISEASE	HOST(S)	LOCALITY	REMARKS
Bulls Eye Spot *Chrystolariella pyramidalis*	Boxelder	Pomfret	
Fir Fern Rust *Uredinopsis mirabilis*	Balsam Fir	Springfield	Moderate damage to Christmas trees.
Brown Rot *Monilinia fructicola*	Sweet Cherry	Chester	Ornamentals completely defoliated.
Pine Needle Rust *Coleosporium asterum*	Red Pine	Ludlow	Ornamentals.
Naemacyclus Needlecast *Naemacyclus niveus*	Scots Pine	Springfield	Christmas trees.
Spruce Needlecast *Lirula macrospora*	Red Spruce	Landgrove	On regeneration.

ROOT ROTS

Annosus Root Rot, caused by *Heterobasidion annosum*, was responsible for mortality of red pine adjacent to the North Springfield Reservoir. Spore traps were set in a known infection center in the Chester Town Forest at monthly intervals from November to May. Five 4" diameter disks of fresh, aseptically debarked red pine stem wood were placed within forty feet of *H. annosum* sporophores. Disks were left in place for at least four hours. After incubation at room tempearture for over a week, they were checked for growth of the *Oedocephalum* stage. No growth occurred in the traps put out from December through March, when there were at least 8" of snow on the site. Growth occurred on all five disks put out on both dates which had no snow cover.

Shoestring Root Rot, caused by *Armillaria mellea* continues to be associated with spruce mortality following thinning. Bark beetles (Ips) are associated with new mortality in red spruce plots in Plymouth and Peru, where previous mortality has been attributed to *Armillaria*. No new mortality occurred in a Norway spruce stand in Sharon where Armillaria has been associated with dead trees since the area was thinned.

DIEBACKS, DECLINES & ENVIRONMENTAL DISEASES

Place all the following that you observed in narrative form.

ASH DIEBACK remains common throughout the region, with mortality most noticeable in pole-sized and young sawtimber trees. Requests for information about dying ash are mostly from Bennington and Windham Counties, indicating that the disease may be more common in the southern part of the state. Microscopic analysis of a witches' broom from Addison County using Diene's stain tested positive for the presence of mycoplasmas.

BIRCH DECLINE and dieback in Northwest Plymouth was associated with the presence of nodules on the twigs, apparently caused by a small unidentified insect larva.

FROST DAMAGE occurred in scattered locations, from a hard freeze (as low as 24°F) on June 3, and frost events the first week of May. The June frost resulted in extensive damage to balsam fir Christmas trees in Weston, and some damage to Christmas trees in Dorset, Woodstock and Mt. Holly. Frost damage to the upper crowns of sugar maple was observed at higher elevations in Windsor and Rutland Counties, including a 76 acre area in Chittenden. Trees in that area did not completely refoliate. Damage to ash in Danby occurred following the early frost.

LARCH DECLINE is still evident in Whitingham.

MAPLE DECLINE continues to occur in scattered areas. In sugarbushes and roadsides, dieback is often most severe on wounded trees. Dieback is often more common on shallow or wet sites, and at higher elevations. Red maple decline is occurring in several areas in Bennington County.

DIEBACKS, DECLINES & ENVIRONMENTAL DISEASES

ROOT DISTURBANCE from commercial development has led to foliage thinning and dieback of affected trees.

WHITE PINE NEEDLE BLIGHT was observed throughout the region, although less frequently than in the past several years.

ICE DAMAGE was heavy in scattered locations in the center of the region following an ice storm on March 14-15. The heaviest damage occurred at elevations between 1800-2500'. Although damage areas could not be detected or mapped in a special flight on April 26, about 600 acres are affected in Winhall alone. Data from Peru and Andover (7 prism points) show that, in damaged areas, 70% of the basal area had broken crowns. 17% of the crowns were at least half gone. Species affected included beech, yellow birch, sugar maple, and white ash.

HERBICIDE INJURY is a suspected in the dieback of Christmas trees in Woodstock, Weston, and Westminster. Damage may be attributed to using products at unlabeled rates or on unlabeled crops.

TRANSPLANT FAILURES commonly occurred this year on ornamental conifers or Christmas trees which were planted too deep. In scattered locations, the pattern of mortality suggested that dead or dying stock was planted.

DRAINAGE CHANGE is responsible for decline and mortality in a small white pine stand in Woodstock where trees had been stressed by a wet site.

HAIL STORMS on June 1 caused defoliation and leaf tattering in scattered Windsor County locations.

HEAVY WIND in late August caused moderate defoliation to a maple stand in Londonderry.

ANIMAL DAMAGE

ANIMAL	SPECIES DAMAGED	LOCALITY	REMARKS
Deer	Christmas Trees	Perkinsville	
Mouse	White Fir	Westminster	Christmas trees in converted Agricultural land.
Porcupine		Throughout	Requests for control continue.
Squirrel	Maple Tubing	Londonderry Chester/Grafton	
Sapsucker	White Birch Ironwood	Barnard	Very heavy damage to ornamentals, causing dieback.
Grosbeaks	Balsam Fir White Pine	Plymouth Reading	Terminal buds missing on regeneration.